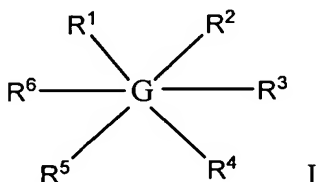


AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A heterodiamondoid compound of the following Formula I:



wherein:

G is comprising a diamondoid nucleus selected from a triamantane or higher diamondoid nucleus having at least one of its carbon atoms replaced by a heteroatom selected from the group consisting of nitrogen, phosphorus, selenium, aluminum, and arsenic; and

R¹, R², R³, R⁴, R⁵, and R⁶ are each independently hydrogen or a covalently bonded functional group, provided that the covalently bonded functional group does not comprise a heteroaryl or heterocycle moiety.

2. (Currently Amended) The heterodiamondoid compound of claim 1 wherein at least one secondary carbon in the diamondoid nucleus is replaced by a heteroatom.
3. (Currently Amended) The heterodiamondoid compound of claim 1 wherein at least one tertiary carbon in the diamondoid nucleus is replaced by a heteroatom.
4. (Currently Amended) The heterodiamondoid compound of claim 1 comprising one heteroatom.
5. (Currently Amended) The heterodiamondoid compound of claim 1 comprising more than one heteroatoms.

6. (Currently Amended) The heterodiamondoid compound of claim 1 comprising two or more different heteroatoms.
7. (Canceled)
8. (Canceled)
9. (Currently Amended) A The heterodiamondoid compound of claim 1 wherein the diamondoid nucleus is a triamantane nucleus.
10. (Currently Amended) A The heterodiamondoid compound of claim 1 wherein the diamondoid nucleus is a higher diamondoid nucleus.
11. (Currently Amended) A The heterodiamondoid compound of claim 1 wherein at least one of the heteroatoms replacing a carbon atom is an electron-donating heteroatom.
12. (Canceled)
13. (Currently Amended) The heterodiamondoid compound of claim 11, wherein the electron-donating heteroatom is selected from the group consisting of nitrogen, phosphorus, and arsenic.
14. (Currently Amended) The heterodiamondoid compound of claim 11, which is an aza-diamondoid.
15. (Currently Amended) The heterodiamondoid compound of claim 11, wherein the electron-donating heteroatom is sp³-hybridized in the diamond lattice.
- 16 - 25. (Canceled)
26. (Currently Amended) A The ~~functionalized~~ heterodiamondoid compound ~~comprising a heterodiamondoid of claim 1 with one or more covalently bonded~~

~~functional groups pendant from its diamondoid nucleus wherein at least one of R¹, R², R³, R⁴, R⁵, and R⁶ is a covalently bonded functional group.~~

27. (Currently Amended) A ~~The functionalized heterodiamondoid compound of claim 9 comprising a heterodiamondoid of claim 8 with one or more covalently bonded functional groups pendant from its diamondoid nucleus wherein at least one~~ of R¹, R², R³, R⁴, R⁵, and R⁶ is a covalently bonded functional group.

28. (Currently Amended) A ~~The functionalized heterodiamondoid compound comprising a heterodiamondoid of claim 10 with one or more covalently bonded functional groups pendant from its diamondoid nucleus wherein at least one of R¹, R², R³, R⁴, R⁵, and R⁶ is a covalently bonded functional group.~~

29. (Currently Amended) The ~~functionalized heterodiamondoid compound of claim 26 wherein the one or more functional groups~~ covalently bonded functional group comprise a group selected from the group consisting of halo, thio, oxide, hydroxyl, nitro, sulfonylhalide, sulfonate, phosphine, added alkyl, alkenyl, alkynyl and aryl, with or without substitution.

30. (Currently Amended) A ~~The functionalized heterodiamondoid compound of claim 26 wherein the one or more functional groups~~ comprise a halo.

31. (Currently Amended) The functionalized heterodiamondoid compound of claim 26 wherein the one or more functional groups comprise a hydroxide.

32. (Original) The functionalized heterodiamondoid compound of claim 26 wherein the one or more functional groups comprise an oxide.

33. (Currently Amended) The functionalized heterodiamondoid compound of claim 26 wherein the one or more functional groups comprise a nitrate.

34. (Currently Amended) The functionalized heterodiamondoid compound of claim 26 wherein the one or more functional groups comprise a group selected from

the group consisting of haloalkyl; haloalkenyl; haloalkynyl; hydroxyalkyl; heteroaryl; alkylthio; alkoxy; aminoalkyl; aminoalkoxy; heterocycloalkoxy; cycloalkyloxy; aryloxy; heteroaryloxy; $-C(O)Z$ wherein Z is hydrogen, alkyl, halo, haloalkyl, halothio, amino, monosubstituted amino, disubstituted amino, cycloalkyl, aryl, heteroaryl; $-CO_2Z$; $-R_7COZ$ wherein R_7 is alkenyl, aminoalkenyl, or haloalkenyl; $-R_7COOZ$; $-OSO_3H$; NH_2 ; NHR' ; $NR'R''$; and $N+R'R''R'''$ wherein R' , R'' , and R''' are independently alkyl, thio, thioalkyl, heteroalkyl, aryl, or heteroaryl; R_8NHCOR_9 wherein R_8 is selected from the group consisting of CH_2 , OCH_2 , $NHCH_2$, CH_2CH_2 , and OCH_2CH_2 and R_9 is selected from the group consisting of alkyl, aryl, heteroaryl, aralkyl, and heteroaryl; and $R_{10}CONHR_{11}$ wherein R_{10} is selected from the group consisting of CH_2 , OCH_2 , $NHCH_2$, CH_2CH_2 , and OCH_2CH_2 , and R_{11} is selected from the group consisting of alkyl, aryl, heteroaryl, aralkyl, and heteroaralkyl.

35. (Currently Amended) The functionalized heterodiamondoid compound of claim 26, wherein the one or more functional groups comprise a polymerizable functional group.

36. (Currently Amended) The heterodiamondoid compound of claim 1 as a discrete molecule.

37. (Currently Amended) The heterodiamondoid compound of claim 1 as a crystal.